

prairie mole cricket (*Gryllotalpa major*) and thereby provide the species protection under the Endangered Species Act of 1973, as amended (Act). Historically this species occurred extensively in that portion of the tallgrass prairie that included eastern Kansas and eastern Oklahoma, the southwest one-fourth of Missouri, and northwest Arkansas. Records of disjunct populations are also known from central Kansas, southeast Missouri, southern Illinois and central Mississippi. As a result of the conversion of native prairie to cropland and other uses, the range and number of prairie mole crickets have been reduced to the point where they now exist only in eastern Kansas and central and northeastern Oklahoma, southwest Missouri, and northwest and central Arkansas. Critical habitat is not being proposed. The Service seeks data and comments from the public on this proposal.

DATES: Comments from all interested parties must be received by June 25, 1990. Public hearing requests must be received by June 11, 1990.

ADDRESSES: Comments and materials concerning this proposal should be sent to the Regional Director, U.S. Fish and Wildlife Service, Federal Building, Ft. Snelling, Twin Cities, Minnesota 55111. Comments and materials received will be available for public inspection by appointment during normal business hours at the above address.

FOR FURTHER INFORMATION CONTACT: James M. Engel, Endangered Species Coordinator at the above address (612/725-3276 or FTS 725-3276).

SUPPLEMENTARY INFORMATION:

Background

The earliest records of *Gryllotalpa major* are dated from the 1870's from eastern Kansas and southwest Missouri. Saussure described the first specimen from Illinois in 1874. Historical records indicate specimens were collected from Arkansas, Illinois, Oklahoma, and Mississippi, in addition to Kansas and Missouri. Collecting continued until the 1930's, when it seemed to decline significantly (Figg and Calvert 1987). At the time of the Service's 1984 Invertebrate Species Notice of Review (49 FR 21664) the prairie mole cricket was thought to be extinct. The closest relative to the prairie mole cricket is an African species *Gryllotalpa gryllotalpa* (Dennis Figg, Missouri Department of Conservation, *in litt.* 1989).

Adult prairie mole crickets are among the largest insects in North America and may measure up to 6 cm (2.5 inches) from end to end, including the antennae

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018-AB

Endangered and Threatened Wildlife and Plants; Proposed Threatened Status for Prairie Mole Cricket

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: The Service proposes to determine threatened status for the

(Figg and Calvert 1987). The prairie mole cricket can sometimes be distinguished from the normally smaller northern mole cricket (*Gryllotalpa hexadactyla*) by its size. The northern mole cricket measures 20–35 mm (.75–1.4 inches). Walker (pers. comm. in Figg and Calvert 1987) reports the prairie mole cricket may weigh up to 2.6 grams. Figg (*in litt.* 1989) suggests that simple field method to distinguish these species is to observe the process on the trochanter of the foreleg, which is knife shaped on the prairie mole cricket and more circular on the common northern mole cricket. The northern mole cricket is found in marshes, wetlands, and along rivers and lakes.

Adult mole crickets become active at the soil surface twice during the year, most notably during the spring for courtship and reproduction (Figg and Calvert 1987). Males and females are identical externally, except for modified forewings that the males use to attract sexually responsive females (Alexander 1975). Male mole crickets construct specially designed burrow systems several inches below the soil surface that contain a bulb-like resonant chamber to increase acoustical output when the male calls to attract females during courtship. Males commence calling in late April and continue through May (Figg and Calvert 1987). Calling begins 5 to 10 minutes after sunset and ends at dark. Conditions need to be conducive for the females to fly: warm, dry, and still. Calls at one Missouri prairie in 1987 could be heard over a quarter of a mile away (Figg and Calvert 1987). After courtship, the females disperse into the surrounding habitat, dig a tunnel and lay their eggs (Figg and Calvert 1987). The eggs then hatch in the prairie soil and the young are miniature versions of the adults except they lack wings. It will require two to three years before they grow into adults and are ready for spring courtship.

The habitat preference of the prairie mole cricket is the tallgrass prairie. However, communities where the species is found vary within the prairie ecosystem (Figg and Calvert 1987). Observations by Figg and Calvert indicate that most mole cricket populations occur on silt to sandy loam prairies that are well drained. However, it is not unusual to find sites on ridges with shallow soils. The species has not been found on wet prairies, marshes, dolomite glades, and dry loess prairies. Figg and Calvert observed that males are not evenly distributed in the prairie habitat, but seem to be aggregated. In one instance, 66 percent of the calling

male prairie mole crickets occupied only 4 percent of the available habitat. It is not clear why this type of aggregation occurs. One thought is that the soils most optimal for burrow construction attract the greatest number of crickets. Another conclusion, by Walker (1983), that nightly choruses of an aggregations of males, (a spree) give the females an opportunity to compare males.

Eight specimens were collected near Nevada, Missouri in 1959 and 1960. These records were the stimulus for the most recent prairie mole cricket surveys in 1986 and 1987, when 160 locations in eight states (AR, IA, IL, KS, MO, MS, OK, TX) were surveyed; 63 extant occurrences were discovered (Figg and Calvert 1987). Subsequent fieldwork in 1988 and 1989 places the current population at about 95 occurrences; 49 in Missouri, 18 in Arkansas, 16 in Oklahoma, and 12 in Kansas (Figg, *in litt.* 1989, William Shepherd, Arkansas Natural Heritage Commission, *in litt.* 1989, William Busby, Kansas Natural Heritage Program, *in litt.* 1989, Patricia Melhop-Cifelli, Oklahoma Natural Heritage Inventory, pers. comm. 1989). These populations occur almost exclusively in tallgrass prairie remnants. It is sometimes difficult to accurately count individual burrows due to vegetative cover and the intensity of calling crickets. Figg and Calvert (1987) believe most estimates are high and complete counts over the entire range are needed. Busby (*in litt.* 1989) reports the largest Kansas mole cricket population supports 24 to 30 males. At several locations in Arkansas, Shepherd (pers. comm. 1989) estimated approximately 150 mole crickets. However, at over one-fourth of the sites very few crickets were noted, and many of these had only one cricket present. Surveys were also conducted in Iowa, Illinois, Mississippi, and Texas, but no extant populations were discovered. Surveys in 22 Mississippi localities in the spring of 1989 failed to locate any prairie mole crickets (T.G. Forrest, U. of Mississippi, *in litt.* 1989). Surveys later in the season at two additional Mississippi sites did not reveal crickets (Forrest, pers. comm. 1989). The Arkansas Natural Heritage Commission intends to search for prairie mole crickets in the state's West Gulf Coastal Plain next spring (Shepherd, *in litt.* 1989).

The presettlement tallgrass prairie extended from Canada to Oklahoma and from Nebraska to Indiana. Based on historic records, the prairie mole cricket was presumed to be distributed evenly throughout the southwest portion of the tallgrass prairie, encompassing an area

about the size of the States of Indiana and Oklahoma. Because of habitat destruction, the present distribution of the species has been reduced to small remaining prairie segments in the southwest one-fourth of Missouri, 7 eastern Kansas counties, 5 counties in northwest and central Arkansas, and 7 counties in northeast and central Oklahoma. Most of these extant populations are found on small fragmented remnant prairie areas. Wilcover (1987) estimates that less than 0.5 percent of Missouri's presettlement prairie remains. Most prairie mole cricket populations are now found on prairies of 40 acres or more; the larger prairies are more likely to support the species (Figg, *in litt.* 1989). In Oklahoma, Melhop-Cefelli (pers. comm. 1989) reports that almost all present occurrences of the species are on "quite small" prairie remnants.

Prairie mole crickets co-occur on eight Missouri prairies and six sites in Kansas where the federally threatened plant *Asclepias meadii* (Mead's milkweed) is found. In Oklahoma, the prairie mole cricket is known from two prairies where the federally threatened plant *Platanthera praeclara* (Western prairie fringed orchid) is known to occur.

Gryllotalpa major was recognized as a category 2 species in the Service's May 22, 1984 (49 FR 21664) Invertebrate Species Notice of Review. Category 2 species are those for which existing information indicates the possible appropriateness or preparing a proposed rule, but for which conclusive data on biological vulnerability and threats are not currently available to support such an action. The species had not been observed since 1963, and was thought to be extinct at the time the May 22, 1984 Notice of Review was published. In 1986, the Service, in cooperation with the Missouri Department of Conservation initiated a rangewide survey for the prairie mole cricket. Biologists from Arkansas, Illinois, Kansas, Missouri, Mississippi, and Oklahoma participated in field surveys in 1986 and 1987. The compilation of this survey by Dennis E. Figg and Paul D. Calvert in 1987, which was updated in 1988 and 1989, substantiates the species' rarity and the continued threats to its habitat.

Summary of Factors Affecting the Species

Section 4(a)(1) of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) and regulations (50 CFR part 424) promulgated to implement the listing provisions of the Act set forth the procedures for adding species to the

Federal Lists. A species may be determined to be endangered or threatened due to one or more of the five factors described in section 4(a)(1). These factors and their application to the prairie mole cricket (*Gryllotalpa major*) Saussure are as follows:

A. *The present or threatened destruction, modification, or curtailment of its habitat or range.* Historically the prairie mole cricket was known to occupy prairie habitat spread over a continuous area of 270,000 square km (104,250 sq. mi). Habitat modification and destruction of the tallgrass prairie are the primary factors threatening the continued existence of the prairie mole cricket. The species is usually found in ungrazed native tallgrass prairie areas where the soils are silt to sandy loam. Areas with silt to sandy loam soils are easily converted for other agricultural purposes (Figg and Calvert 1987). In Kansas, eight populations are found on private land, and at least two of these are currently threatened by development or conversion to cropland (Busby, *in litt.* 1989). Fourteen of the sixteen Oklahoma sites face threats of destruction from housing developments and grazing (Mehlhop-Cifelli, *in litt.* 1989). Because of agricultural conversion, the prairie habitat necessary for this species has been reduced to small remnants often isolated by miles of non-prairie habitat (Figg and Calvert 1987). Prairie mole crickets occurring on these small isolated areas subject to several factors which may make them vulnerable to extinction in the same manner as other small populations of plants and animals: vulnerability to natural catastrophe, demographic stochasticity, genetic deterioration and social dysfunction (Wilcove 1986). Figg and Calvert (1987) note that the larger prairie mole crickets populations appear to be associated with an aggregation of prairie remnants. These closely associated areas may reinforce the population by enabling the crickets to disperse throughout the immediate range of available habitat and associated management influence.

Prairie mole crickets are usually found on ungrazed or mowed native tallgrass prairies. However, the Oklahoma, prairie mole crickets have been found in lightly grazed areas (Mehlhop-Cifelli, pers. comm. 1989). Historical records indicate the prairie mole cricket was distributed throughout the Flint Hills of Kansas, now one of the largest remaining tallgrass prairie areas in the United States. It remains a mystery why so few extant populations of prairie mole crickets have been found in the Kansas Flint Hills, possible because

most cricket populations are found on mowed or ungrazed prairies. There are very few ungrazed prairie areas remaining in the Flint Hills. In Arkansas, the historical range of the prairie mole cricket coincided with three prairie regions of the State: Springfield Plateau and Cherokee Prairie in the northeast, and the Grand Prairie in the east central part of the state (Shepherd, *in litt.* 1989). These once vast prairie areas have been reduced for industrial, agricultural and residential uses to the point where only very small isolated prairie areas remain that are suitable for the prairie mole cricket.

B. *Overutilization for commercial, recreational, scientific, or educational purposes.* Records do not indicate if collection was a factor in the decline of this species. It is ironic that the records from an amateur collection of eight specimens in 1959 and 1960 provided the stimulus to investigate the status of the prairie mole cricket. Now, because of the species' rarity, and the fact that the public will know that a species recently believed extinct exists, there is the possibility that amateur scientific collections will resume.

C. *Disease or predation.* No diseases or predation are known to be adversely affecting the prairie mole cricket.

D. *The inadequacy of existing regulatory mechanisms.* The prairie mole cricket is not presently offered any form of protection by any of the States where the species occurs. The Act offers possibilities for protection through section 6 by cooperation between States and the Service, and cooperation through section 7 (interagency cooperation) requirements.

E. *Other natural or manmade factors affecting its continued existence.* Little is known about the biology of the prairie mole cricket. Figg and Calvert (1987) report that the small number of reproductive males in many of the populations may not attract a sufficient number of females to sustain a population. Figg and Calvert also noted that extant populations of prairie mole crickets appear to contain relatively small numbers of reproductive males. The low number of individuals in many of these scattered prairie remnants presents a dilemma. If this situation continues, populations will remain low and may eventually be lost because the number of males may not be sufficient to attract females in order to maintain a sustaining population. As Wilcove (1987) points out, species in fragmented areas may not recognize their habitat limits and may disperse to outlying prairie remnants that are unsuitable for survival. Figg (*in litt.* 1989) reaffirms

this, and also states that reports of single mole crickets found in non-prairie areas have all been females that have apparently dispersed after courtship and mating. Stinner et al (1983) mentions that local flights seem to have no effect on population density, but migration flights have the potential of depleting a local population.

The Service has carefully assessed the best scientific information available regarding the past, present, and future threats faced by this species in determining to propose this rule. Based on this evaluation, the preferred action is to list the prairie mole cricket as a threatened species. Due to the vulnerability of the prairie mole cricket from habitat loss and the continued threats to existing populations, the species will continue to decline unless immediate actions are undertaken to bring attention to its plight. For reasons detailed below, it is not considered prudent to propose designation of critical habitat.

Critical Habitat

Section 4(a)(3) of the Act, as amended, requires that, to the maximum extent prudent and determinable, the Secretary propose critical habitat at the time the species is proposed to be endangered or threatened. The Service finds that designation of critical habitat is not presently prudent for this species at this time. This determination is based on the premise that such a designation would not be beneficial to the species (50 CFR 424.12). As discussed under "Factor B" above, now that the prairie mole cricket is once again known to exist, it may become vulnerable to collectors who would be drawn to the known populations by the publication of critical habitat maps and other specific location information. Since it is thought that prairie mole crickets remain in the same prairie area year around, critical habitat designation would not provide additional protection over that afforded through the normal section 7 consultation procedures.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Endangered Species Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups, and individuals. The Endangered Species Act provides for possible land acquisition and cooperation with the

States and requires that recovery actions be carried out for all listed species. The protection required of Federal agencies and the prohibition against taking and harm are discussed, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) requires agencies to confer informally with the Service on any action that is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat. If a species is listed subsequently, section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service. The Service has not identified any ongoing or proposed projects with Federal involvement that could affect this species.

The Act and its implementing regulations found at 50 CFR 17.21 and 17.31 set forth a series of general prohibitions and exceptions that apply to all threatened wildlife. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take, (includes harass, harm, pursue, hunt, shoot, wound, kill, trap, or collect; or to attempt any of these), import or export, ship in interstate commerce in the course of a commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

The Act and 50 CFR 17.32 also provide for the issuance of permits to carry out otherwise prohibited activities involving threatened wildlife species under certain circumstances. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in connection with otherwise lawful activities. For threatened species, there

are also permits for zoological exhibitions, educational purposes, or special purposes consistent with the purposes of the Act. In some instances, permits may be issued during a specified period of time to relieve undue economic hardship that would be suffered if such relief were not available.

The Food Security Act of 1985 (Pub. L. 99-198) also provides at sections 1314 and 1318 opportunity for the Service and State conservation agencies to acquire restrictive easements beneficial to endangered and threatened species on lands acquired by the Farmers Home Administration in the course of farm foreclosures. Upon notification by the Farmers Home Administration of pending foreclosures, the Service is continually reviewing possible areas where restrictive easements would benefit endangered and threatened species.

Public Comments Solicited

The Service intends that any final action adopted will be accurate and as effective as possible in the conservation of endangered and threatened species. Therefore, comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry, or any other interested party concerning any aspect of this proposal are hereby solicited. Comments particularly are sought concerning:

- (1) Biological, commercial trade, or other relevant data concerning any threat (or lack thereof) to the prairie mole cricket;
- (2) The location of any additional populations of the prairie mole cricket and the reasons why any habitat should or should not be determined to be critical habitat as provided by section 4 of the Act;
- (3) Additional information concerning the range, distribution, and population size of the species;
- (4) Current or planned activities in the subject area and their possible impact on the prairie mole cricket.

Final promulgation of the regulation on the prairie mole cricket will take into consideration the comments and any additional information received by the Service, and such communications may lead to adoption of a final regulation that differs from this proposal.

The Endangered Act provides for a public hearing on this proposal, if requested. Requests must be filed within 45 days of the date of the proposal. Such requests must be made in writing and addressed to the Regional Director (see **ADDRESSES** section above).

National Environmental Policy Act

The Fish and Wildlife Service has determined that an Environmental Assessment, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244).

References Cited

- Alexander, R.D. 1975. Natural Selection and Specialized Chorusing Behavior in Acoustical Insects. IN D. Pimental, ed., *Insects, Science and Society*. Academic Press, New York.
- Figg, D.E. and P.D. Calvert. 1987. Status, Distribution, and Life History of the Prairie Mole Cricket, (*Gryllotalpa major*) Sassurre. Unpublished report. 39 pp.
- Wilcove, D.S. 1987. From Fragmentation to Extinction. *Natural Areas Journal* 7(1):23-29.
- Stinner, R.E., C.S. Barfield, J.L. Stinner, and L. Dohse. 1983. Dispersal and Movement of Insect pests. *Ann. Rev. Entomol.* 28:319-335.
- Walker, T.J. 1983. Diel patterns of calling in nocturnal orthoptera. Pages 45-72. IN D.T. Gwynne and G.K. Morris, eds. *Orthopteran mating systems: sexual competition in a diverse group of insects*. Westview Press, Boulder, CO.

Author

The primary author of this rule is William F. Harrison (see **ADDRESSES** section). Mr. Dennis E. Figg and Mr. Paul D. Calvert, Missouri Department of Conservation, Jefferson City, Missouri 65102-0180, (314)751-4115, provided substantial information.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Fish, Marine mammals, Plants (agriculture).

Proposed Regulation Promulgation

Accordingly, it is hereby proposed to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—[AMENDED]

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361-1407; 16 U.S.C. 1531-1543; 16 U.S.C. 4201-4245; Pub. L. 99-625, 100 Stat. 3500; unless otherwise noted.

2. It is proposed to amend § 17.11(h) by adding the following, in alphabetical order under INSECTS, to the List of Endangered and Threatened Wildlife:

§ 17.11 Endangered and threatened wildlife.

(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
Insects							
Cricket, prairies.....	<i>Gryllotalpa major</i>	U.S.A. (AR, IL, KS, KY, MO, MS, OK, TN)	NA	T		NA	NA

Dated: March 30, 1990.

Richard N. Smith,

Acting Director, Fish and Wildlife Service

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